

122. The curved plate **310** is radially along the disk cavity **126** at a downstream side with respect to the rotation direction **R** of the rotor disk **120** after assembly. During operation of the gas turbine engine **100**, rotation of the rotor disk **120** and the seal plate **200** therewith makes the curved plate **310** of the flow inducer assembly **300** functioned as a paddle that further induces cooling air **130**, such as ambient air, in addition to centrifugal force caused by rotation of the turbine blades **140**, into the disk cavity **126** and enters insides of the turbine blades **140** from the blade roots **144** for cooling the turbine blades **140**. A locking plate **246** may be inserted into a disk slot **128** for securing the seal plate **200** to the rotor disk **120**. FIG. 9 illustrates a schematic perspective view of a locking plate **246**.

[0031] According to an aspect, the proposed flow inducer assembly **300** may enable using ambient air as cooling fluid **130** for sufficiently cooling the last stage of turbine blades **140** of a gas turbine engine **100**. During operation of the gas turbine engine **100**, rotation of the rotor disk **120** and the seal plate **200** therewith makes the flow inducer assembly **300** functioned as a paddle that drives sufficient amount of ambient air from outside of the gas turbine engine **100** as the cooling air **130** into disk cavities **126** of rotor disk **120** and enters insides of the turbine blades **140** from the blade roots **144** for cooling the turbine blades **140**. The proposed flow inducer assembly **300** eliminates bleeding compressor air for cooling the last stage of turbine blades **140**, which increases turbine engine efficiency.

[0032] According to an aspect, the proposed flow inducer assembly **300** may be manufactured as an integrated piece of the seal plate **200**. The seal plate **200** and the integrated flow inducer assembly **300** provide a lightweight design for preventing hot gas coming into the rotor disk **120** and simultaneously driving enough ambient air for sufficiently cooling the last stage of turbine blades **140** to achieve required boundary condition. The seal plate **200** and the integrated flow inducer assembly **300** provide sufficient cooling of the last stage of the turbine blades **140** with minimal cost.

[0033] Although various embodiments that incorporate the teachings of the present invention have been shown and described in detail herein, those skilled in the art can readily devise many other varied embodiments that still incorporate these teachings. The invention is not limited in its application to the exemplary embodiment details of construction and the arrangement of components set forth in the description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of “including,” “comprising,” or “having” and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. Unless specified or limited otherwise, the terms “mounted,” “connected,” “supported,” and “coupled” and variations thereof are used broadly and encompass direct and indirect mountings, connections, supports, and couplings. Further, “connected” and “coupled” are not restricted to physical or mechanical connections or couplings.

REFERENCE LIST

- [0034]** 100: Gas Turbine Engine
[0035] 120: Rotor Disk

- [0036]** 122: Disk Groove
[0037] 124: Blade Mounting Section
[0038] 126: Disk Cavity
[0039] 128: Disk Slot
[0040] 130: Cooling Flow
[0041] 140: Turbine Blade
[0042] 142: Blade Platform
[0043] 144: Blade Root
[0044] 200: Seal Plate
[0045] 202: Seal Plate Hook
[0046] 204: Seal Plate Protrusion
[0047] 220: Upper Seal Plate Wall
[0048] 230: Seal Arm
[0049] 240: Lower Seal Plate Wall
[0050] 242: Aperture on Lower Seal Plate Wall
[0051] 244: Seal Plate Root
[0052] 246: Locking Plate
[0053] 300: Flow Inducer Assembly
[0054] 310: Curved Plate having Scoop Shape
[0055] 320: Floor Plate
[0056] 330: Inner Side Wall
[0057] 340: Outer Side Wall
[0058] 342: Vertical Wall
[0059] 350: Cooling Fluid Inlet

What is claimed is:

1. A gas turbine engine comprising:

- a rotor disk comprising a plurality of circumferentially distributed disk grooves, wherein each disk groove comprises a blade mounting section and a disk cavity;
 - a plurality of turbine blades, wherein each turbine blade comprises a blade root that is inserted into the blade mounting section of the disk groove;
 - a plurality of seal plates attached to aft side circumference of the rotor disk, wherein each seal plate comprises an upper seal plate wall and a lower seal plate wall, wherein the upper seal plate wall is configured to cover the blade root; and
 - a plurality of flow inducer assemblies, wherein each flow inducer assembly is integrated to each seal plate at a side facing away from the rotor disk,
- wherein the flow inducer assembly is configured to function as a paddle due to rotation of the rotor disk and the seal plate therewith during operation of the gas turbine engine to induce a cooling fluid into the disk cavity and enter inside of the turbine blade from blade root for cooling the turbine blade.

2. The gas turbine engine as claimed in claim 1, wherein the lower seal plate wall comprises an aperture, and wherein the aperture is configured to align with the disk cavity after attached to the rotor disk.

3. The gas turbine engine as claimed in claim 2, wherein the flow inducer assembly comprises a curved plate, wherein the curved plate is integrated to the lower seal plate wall and axially extends out from the lower seal plate wall, and wherein the curved plate is configured to along a downstream side of the aperture with respect to a rotation direction of the rotor disk.

4. The gas turbine engine as claimed in claim 3, wherein the curved plate comprises a scoop shape.

5. The gas turbine engine as claimed in claim 2, wherein the flow inducer assembly comprises a floor plate axially extending from the lower seal plate wall at a radial location at least of the lowest radial point of the aperture, wherein the flow inducer assembly comprises an inner side wall and an